REMARKS

By the present amendment independent claims 1 and 12 have been amended and claims 10 and 19 have been cancelled. Claims 1-9, 11-18, and 20-22 remain in the application with claims 1 and 12 being in independent form.

By the present amendments both independent claims have been amended to include the limitation that the substrate material or the nozzle be moved relative to the other at a traverse speed of from 70 to 260 millimeters per second. Support for this limitation can be found in Tables 1-3 and original claims 10 and 19.

The Examiner rejected claims 1-6 and 9-11 under 35 U.S.C. § 103(a) based on Rayburn (US 3731354) in view of Tawfik et al. (US 2004/0101738), Van Steenkiste et al. (US 6283386) and Hathaway (US 2599710). The Examiner further rejected claim 7 under 35 U.S.C. § 103(a) based on Rayburn (US 3731354) in view of Tawfik et al. (US 2004/0101738), Van Steenkiste et al. (US 6283386), Hathaway (US 2599710), and Martyniak (US 4263341). The Examiner rejected claim 8 under 35 U.S.C. § 103(a) based on Rayburn (US 3731354) in view of Tawfik et al. (US 2004/0101738), Van Steenkiste et al. (US 6283386), Hathaway (US 2599710), and Kashirin et al. (US 6402050).

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching, suggestion, or motivation that would lead one of ordinary skill in the art to combine the references. *In re Sang Su Lee*, 277 F.3d 1338 ; 61 USPQ 2nd. 1430 (Fed. Cir. 2002), citing *Brown & Williamson Tobacco Corp, v. Phillip Morris, Inc.*, 229 F.3d 1120, 1124-25 (Fed. Cir. 2000); *In re Napier,* 34 U.S.P.Q. 2d 1782 (Fed. Cir. 1995). Elements of separate prior patents cannot be combined when there is no suggestion of

such combination anywhere in those patents. *Panduit Corp. v. Dennison Mfg. Co.*, 1 USPQ 2d 1593 (Fed. Cir. 1987). Virtually all inventions are necessarily combinations of old elements and, thus the notion that combination claims can be declared invalid merely upon the finding of similar elements in separate prior patents would necessarily destroy virtually all patents and cannot be the law under section 103. *Id.* The U.S. Court of Appeals for the Federal Circuit recently made the following statements in *Yamanouchi Pharmaceutical Co., Ltd. v. Danbury Pharmacal, Inc.* 56 USPQ2d 1641, 1644 (Fed. Cir. 2000) concerning the combination of old elements:

> "virtually all [inventions] are combinations of old elements . Therefore, an Examiner [or accused infringer] may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate the patentability very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner [or accused infringer] to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention...To counter this potential weakness in the obvious construction, the suggestion to combine requirements stands as a critical safe guard against hindsight analysis and rote application of the legal test for obviousness." [Emphasis added]

Further, when claimed subject matter has been rejected as being obvious in view of a combination of prior art references a proper analysis under section 103 requires a consideration of two factors: [1] Whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process;

and [2] whether the prior art would also have revealed that, in so making or carry out , those of ordinary skill would have a reasonable expectation of success. *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991), *In re Dow Chemical Company*, 5 USPQ2d 1529 (Fed. Cir. 1988). Both the suggestion and the reasonable expectation of success must be found in the prior art not in the applicant's disclosure. *Id.* The mere fact that the prior art can be modified does not make the modification obvious unless prior art taught or suggested the desirability of the modification. *In re Gordon,* 221 USPQ 1125, 1127 (Fed. Cir. 1984).

Obviousness may not be established by hindsight. *Kahn v. General Motors Corp.* , 45 USPQ2d 1608 (Fed. Cir. 1998). Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention. *In re ATD Corp v. Lydal, Inc.*, 48 USPQ2d 1321, 1329 (Fed.Cir.1998). Combining prior art references without evidence of a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability-the essence of hindsight. *In re Dembiczak*, 50 USPQ2d 1614 (Fed. Cir. 1999). The prior art must suggest to one of ordinary skill in the art the desirability of the claimed combination. *In re Fromsom v. Advanced Offset Plate Inc.,* 225 USPQ 26, 31 (Fed. Cir. 1985). Good ideas may well appear "obvious" after they have been disclosed after despite having been previously unrecognized. *In re Arkie Lures, Inc. v. Gene Larew Tackle, Inc.* 43 USPQ2d 1294 (Fed. Cir. 1997).

In making the rejections of claims 1-11 the Examiner has failed to point any specific teaching, suggestions, or motivations found within the references themselves for combining the references and then for modifying the teachings to make applicant's invention obvious. Instead

the Examiner states "the reason to combine can be found in knowledge generally available to one of ordinary skill in the art" with no explanation of what this knowledge is or why it would lead to the combination. What the Examiner has done is take the Applicants' invention and use it as a blueprint for finding the six cited references, this is impermissible hindsight. The cited references can not properly be combined and even when combined they do not make the present invention obvious.

The primary reference, Rayburn, teaches a method for making a multilayer plastic chip capacitor that includes a thermal spraying step. The thermal spraying is used to form a contact between alternate electrode layers which extend to a common end of the capacitor to place all of the electrodes in the electric field. Column 1, line 59 through column 2, line 8. The molten aluminum "embeds itself in the plastic coatings between the metalized layers so as to contact the surface as well as the ends of the electrodes, but does not substantially penetrate the plastic dielectric strip". Column 2, lines 2-5. The form of thermal spraying of metals onto metal as disclosed in Rayburn relies on using an oxygen-acetylene flame to melt an aluminum wire. The molten aluminum is then broken up into molten droplets using a high velocity air stream and the molten droplets are directed toward a substrate. This is completely the opposite of the kinetic spray method used in the present invention.

All thermal spray processes include a spray system that performs different functions in a completely different way to achieve a different result from the kinetic spray systems as used in the present invention. The cited references Rayburn, Tawfik et al., Martyniak, and Hathaway are all thermal spray systems. Common to all thermal spray systems is the concept of heating a material to be sprayed to a temperature well above its melting point to produce a molten

material. The molten material is then sprayed at a substrate surface while it is still molten where it will bind to the surface as it cools and resolidifies. All thermal spray processes are high temperature processes. Kinetic spray processes are low temperature processes wherein the particles being sprayed are never heated to a temperature anywhere near their melting temperature. Instead kinetic spray relies on the principal of accelerating the particles to a velocity above their critical velocity and using the generated kinetic energy of the particles to cause a bond between the substrate and the particle when the particle strikes the substrate. In a kinetic spray process the physical state of the particles never changes where as in a thermal spray process the particles do change their physical state. Because these processes are fundamentally different the teachings of Rayburn, Tawfik et al., Martyniak, and Hathaway with respect to a spraying process are inapplicable to the present invention.

The Examiner admits that Rayburn does not teach any of the kinetic spray features that are recited in claim 1 nor does Rayburn teach the masking as required by claim 1. In fact, Rayburn teaches nothing that is relevant to the invention as claimed in claim 1 and it teaches away from the kinetic spray method as recited in claim 1. Any removal of plastic in Rayburn is due to the high temperature of the molten aluminum, which must be above 660° C the melting temperature of aluminum.

Tawfik et al. teaches a method of coating a metal substrate directly with a metal corrosion resistant layer, again by using a thermal spray process. In passing Tawfik et al. suggests that cold gas dynamic spraying may be useful to coat a metal with a metal when one is concerned about thermal distortion of the substrate. Tawfik et al., however does not disclose any details of a kinetic spray process. As stated in paragraph [0039] of Tawfik et al. "[t]hus, the

inventive bipolar plate 10 is an all-metallic structure including the metal substrate layer, the corrosion resistant layer formed in the boundary region or interface". Thus, Tawfik et al. like Rayburn, at most teaches a thermal spray method for coating a metal with a metal. Only in passing does Tawfik et al. mention use of kinetic spray to coat a metal substrate with a metal. The Examiner suggests Tawfik et al. teaches using kinetic spraying when embedding particles to avoid overheating as caused by thermal spraying, however, even if this where what Tawfik et al . taught it is inapplicable to the present invention because no particles are being embedded in the present invention as claimed in claim 1. Claim 1 requires that the particles remove the plastic-type material and bind to the substrate below, thus there is no "embedding" occurring.

Van Steenkiste et al. teaches a kinetic spray method, again for coating a metal substrate with a metal. Van Steenkiste et al. provides two tables of data all of which are metal particles applied to a metal substrate, brass. There is no suggestion, teaching, or motivation within any of the references for combining Rayburn, Tawfik et al., and Van Steenkiste et al. Even when combined at most all the combination teaches is that a metal substrate can be **directly coated** with metal particles either by a thermal spray process or a kinetic spray process.

Claim 1 requires using particles with an average nominal diameter of from 60 to 250 microns in a kinetic spray process. In the process a mask is pressed against a substrate material that is covered by a plastic-type material. The mask has at least one opening and the particles entrained in the main gas of the kinetic spray process are directed through the opening. The particles remove the plastic-type material and then bond to the substrate material. Claim 1 furthermore requires that the substrate or the nozzle be moved past the other at a traverse speed of from 70 to 260 millimeters per second. Van Steenkiste et al., which is the only relevant

reference to the present invention and the only one to discuss kinetic spraying does not provide any information regarding traverse speeds. The Examiner suggests that the traverse speed is mere optimization, however there is no hint in the cited references that traverse speed is a result effective variable. Absent such a suggestion it is not mere optimization to discover the importance of this variable when using a kinetic spray process to firstly remove a cover layer over a substrate and to then bind material to the underlying substrate. Each and every limitation of claim 1 is not taught by nor made obvious by the combination of Ray burn, Tawfik et al., and Van Steenkiste et al.

In summary, the Examiner can point to no suggestions, teachings, or motivations within the cited references for combining the cited references other than use of the Applicants' invention as a template for locating the references. Even when combined the cited references fail to teach or make obvious each and every limitation of independent claim 1. The references Rayburn, Tawfik et al., and Van Steenkiste et al. at most **teach directly coating** a metal substrate with a metal either by a thermal spray or a kinetic spray process. Hathaway teaches using masking tape adhesively applied to a dielectric as a mask, sandblasting grooves in the dielectric, and then filling the sandblast formed groove by a thermal spray process. None alone or in combination teach or make obvious a kinetic spray process for coating a plastic covered substrate with particles having a size of from 60 to 250 microns that are kinetically sprayed wherein the particles pass through openings in a mask pressed against the plastic covering, the sprayed particles first removing the plastic material and then bonding to the substrate and wherein the substrate and nozzle are moved relative to each other at a speed of from 70 to 260 millimeters per second as required by claim 1. Thus, the rejection of claims 1-6 and 9-11 under

35 U.S.C. § 103(a) based on Rayburn, Tawfik et al., Van Steenkiste et al. and Hathaway is improper and must be withdrawn.

The Examiner's rejection of claim 7, which depends from claim 1, based on Rayburn, in view of Tawfik et al., Van Steenkiste et al., Hathaway, and Martyniak is likewise improper. The Examiner relies in Rayburn, Tawfik et al., Van Steenkiste et al. and Hathaway as described above. This reliance is misplaced as discussed above and Martyniak does not correct the failures of these references. The Examiner relies on Martyniak for teaching a mask of stainless steel. Martyniak again teaches another use of thermal spray again to directly coat a metal substrate with a metal. For reasons discussed above the references fail to teach or make obvious each and every limitation of claim 1 and claim 7. Thus, the rejection of claim 7 under 35 U.S.C. § 103(a) based on Rayburn, Tawfik et al., Van Steenkiste et al., Hathaway, and Martyniak is improper and must be withdrawn.

The Examiner's rejection of claim 8, which depends from claim 1, based on Rayburn, in view of Tawfik et al., Van Steenkiste et al., Hathaway, and Kashirin et al. is likewise improper. The Examiner relies in Rayburn, Tawfik et al., Van Steenkiste et al. and Hathaway as described above. The Examiner relies on Kashirin et al. as teaching entraining the particles in the flow of the gas in the diverging region of the supersonic nozzle. For the reasons discussed above Rayburn, Tawfik et al., Van Steenkiste et al., and Hathaway can not properly be combined and even if combined they do not make claim 1 obvious. Kashirin et al. does not overcome this failure. Kashirin et al. does not even disclose a single example of using the process to coat any substrate. Kashirin et al. does not discuss traverse speeds and it certainly does not make it obvious alone or in combination with the other references to use a kinetic spray process to spray

through a mask pressed against a plastic coated substrate to remove the plastic coating and then bind to the exposed substrate wherein the particles are entrained in the diverging region of the nozzle as required by claim 8. Thus, the rejection of claim 8 based on the cited references is improper and must be withdrawn.

The Examiner rejected claims 12-16 and 18-20 under 35 U.S.C. § 103(a) as unpatentable over Rayburn in view of Tawfik et al., and Van Steenkiste (US 6,623,796). This combination can not be made for the reasons noted above with respect to Van Steenkiste at al. (US 6,283,386) as used against claim 1. The Examiner relies on Van Steenkiste '796 with respect to claim 12 and those that depend therefrom because claim 12 includes as a limitation particles having an average nominal diameter of from 250 to 1400 microns. Van Steenkiste et al. '386 is limited to particles of from 60 to 106 microns while Van Steenkiste '796 teaches use of particles having an average nominal diameter of up to 250 microns in a kinetic spray process. Again Van Steenkiste is deficient because like Rayburn and Tawfik et al. **it only teaches coating a metal directly with a metal**. In addition, Van Steenkiste '796 teaches that particles size must be no larger than 250 microns. Finally, Van Steenkiste '796 does not disclose any traverse speeds of the nozzle relative to the substrate as required by claim 12. There is no suggestion or teaching in any of the references alone or in combination that would make it obvious to one of ordinary skill in the art that a kinetic spray process could be used to spray particles having an average nominal diameter of from 250 to 1400 microns through a plastic-type covering and have them bond to a substrate beneath the plastic using a traverse speed of from 70 to 260 millimeters per second as required by claim 12. As discussed above Rayburn and virtually all of Tawfik et al. is directed to a thermal spray process, which is a completely

different principal from kinetic spraying. The present invention requires spraying the particles such that they penetrate through a plastic-type covering and bond to the substrate underneath using a traverse speed of from 70 to 260 millimeters per second which is not obvious based on the cited references. In summary, the rejection of claim 12 and the claims which depend therefrom under 35 U.S.C. § 103(a) based on Rayburn in view of Tawfik et al. and Van Steenkiste is improper and must be withdrawn.

The Examiner rejected claim 17 under 35 U.S.C. § 103(a) based on Rayburn in view of Tawfik et al., Van Steenkiste and further in view of Kashirin et al. The rejection of claim 12, which claim 17 depends from, based on Rayburn, Tawfik et al. and Van Steenkiste is improper for the reasons noted above. All Kashirin et al. adds is the disclosure of entraining the particles after the throat of the supersonic nozzle. It does not even discuss the particle sizes, it does not suggest that the process can be use to coat a substrate having an overlay of a plastic material, and there is no disclosure of a traverse speed. Thus, because the cited references do not alone or in combination make all the limitations of claim 17 obvious, the rejection of claim 17 under 35 U.S.C. § 103(a) based on the cited references is improper and must be withdrawn.

The Examiner rejected claims 21-22 under 35 U.S.C. § 103(a) based on Rayburn in view of Tawfik et al., Van Steenkiste and further in view of Martyniak. As discussed above the combination of Rayburn, Tawfik et al., and Van Steenkiste does not make all the limitations of claim 12 obvious. Claims 21 and 22 depend from claim 12 and Martyniak does not supplement the deficiencies of Rayburn, Tawfik et al. and Van Steenkiste. The combination does not teach using a kinetic spray process to spray particles having an average nominal diameter of from 250 to 1400 microns through an opening in a mask toward a plastic covered material to drive the

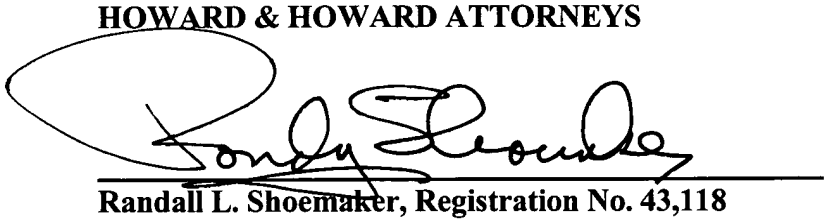
particles through the plastic to bind to the substrate beneath using a traverse speed of from 70 to 2160 millimeters per second. Thus, the rejection of claims 21-22 under 35 U.S.C. § 103 (a) based on Rayburn, Tawfik et al., Van Steenkiste, and Martyniak should be withdrawn.

The Examiner also rejected claims 1-6 and 9-11 under 35 U.S.C. § 103 (a) based on Rayburn in view of Tawfik et al., Van Steenkiste, and Hathaway. This rejection can not be sustained for the reasons noted above with respect to the combination of Rayburn, Tawfik et al., Van Steenkiste et al and Hathaway. All that Van Steenkiste adds to Van Steenkiste et al. is use of particles have an average nominal diameter of up to 250 microns. It does not correct the failures of the combination of Rayburn with Tawfik et al., Van Steenkiste et al., and Hathaway to teach or make obvious every limitation of claim 1. The new combination also does not teach or make obvious the present invention which teaches that the kinetic spray process can be used to spray particles through a mask onto a plastic covered substrate, thereby removing the plastic cover and binding to the substrate beneath using a traverse speed of from 70 to 260 millimeters per second. Similar analysis applies to the Examiner's further rejections of claims 7 and 8 using Van Steenkiste instead of Van Steenkiste et al. Thus, the rejection of claims 1-11 based on Rayburn, Tawfik et al., Van Steenkiste, Hathaway, Kashirin et al., and Martyniak is improper and must be withdrawn.

Applicant's attorney respectfully submits that the claims as amended are now in condition for allowance and respectfully requests such allowance.

Respectfully submitted,

HOWARD & HOWARD ATTORNEYS



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